



Newest Additions to the NSA Patent Portfolio



BIG DATA

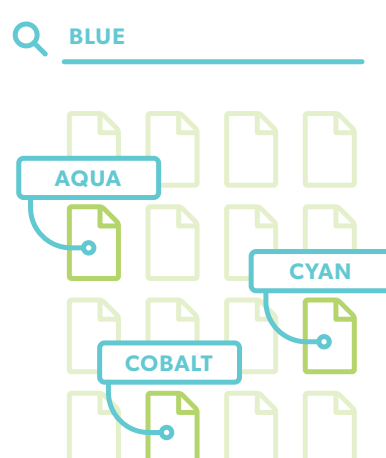
Measuring Word Pair Relevancy

Method and Device for Measuring Word Pair Relevancy
US PATENT # 9,754,020 | EXPIRES FEBRUARY 19, 2036

This technology enables a user to find relevant documents within a large set of data without requiring the keyword to appear in the document. By auto-associating words and documents with a keyword, this method spares the user from needing to know precise terms when searching in a large database or network. Requiring only a large corpus of reference text, this technology is language agnostic and ranks the relevancy of documents to a keyword based on word pair relevancy estimated from the corpus of reference text.

POTENTIAL APPLICATIONS:

- Knowledge discovery applications
- Reference material search tool (medical, legal, academic journals/books)
- Document prioritizers
- File management



CYBER

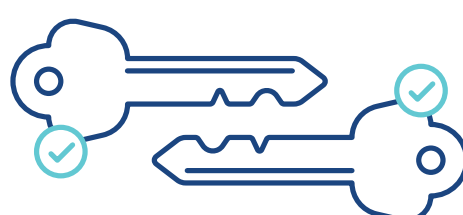
Validating a Private-public Key Pair

Method of Validating a Private-public Key Pair
US PATENT # 9,635,003 | EXPIRES APRIL 25, 2037

This technology is a cryptographic method providing a new level of security for key-pair validation, securing both traditional and quantum-resistant protocols for key establishment. Public key validation is a well-known security practice for modern key establishment protocols. While necessary in many proposed post-quantum systems, post-quantum cryptographic algorithms generally do not support direct public key validation. Migrations of modern Internet peer-to-peer communication protocols, such as Internet Key Exchange (IKE) and Transport Layer Security (TLS) to quantum-resistant technology will require a new key validation technique to be secure.

POTENTIAL APPLICATIONS:

- Secure communications (messaging, web browsing, voice-over-IP)
- Online commerce/shopping website



CYBER

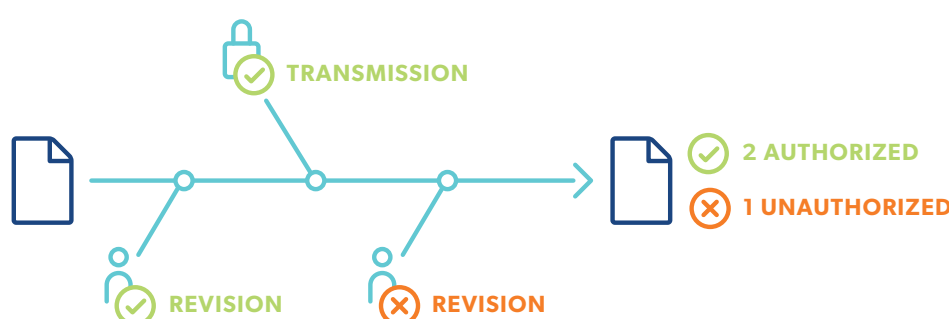
Multilevel Chain of Trust and Revision

Device for and Method of Multilevel Chain of Trust/revision
US PATENT # 9,467,299 | EXPIRES NOVEMBER 29, 2034
Device for and Method of Controlled Multilevel Chain of Trust/revision
US PATENT # 9,467,298 | EXPIRES OCTOBER 28, 2034

This technology is a device and method of multilevel chain of trust and revision that certifies each user, device, action, and circumstance in the creation, modification, and transmission of computer information, and includes a revision history of any modification. While chain of authority certifications give some assurance that transmissions were not altered by an unauthorized entity, this technology enables detection of unauthorized alterations of electronic information at more than just the encryption and transmission levels, notifying users of any revisions made to the electronic information.

POTENTIAL APPLICATIONS:

- Enhanced computer security applications
- System monitoring
- Intrusion prevention systems
- Computer forensics



MOBILITY
CYBER

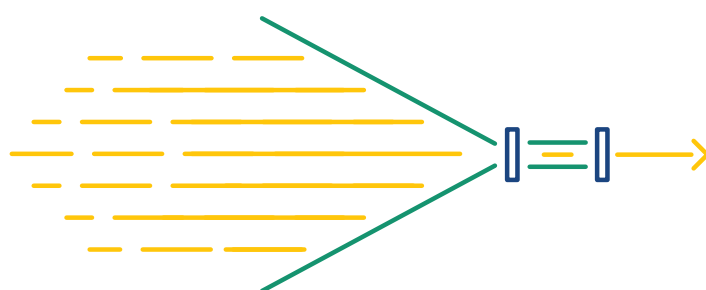
Wide Field of View Concentrator

Wide field of view concentrator
US PATENT # 9,383,080 | EXPIRES JANUARY 9, 2036

This technology, when coupled with a Fresnel lens, concentrates light from a large focal point onto a small spot (0.5mm in diameter) on a detector. A dual lens system allows for light to be focused despite steering imperfections, poorly pointed system placement, or jostling of the system during use. With long distance Free-Space Optics (FSO), light will disperse over a distance due to a variety of factors (precipitation, temperature differentials, airborne particles, off-angle collection, etc.). This dispersion results in a high data error rate, which is detrimental to high-speed data transmission accuracy. This system design significantly mitigates signal loss due to off-angle collection or steering problems within set parameters and improves the signal focus on the detector.

POTENTIAL APPLICATIONS:

- Low power laser or light-emitting diode (LED)-based communications
- Provides passive gain to extend the range for light-based communication systems
- Increase field and distance for light fidelity (Li-Fi) applications
- Solar photovoltaic (PV) or heat concentration applications



MOBILITY

Frequency Estimation for Geolocation

Systems and Methods of Frequency Estimation for Geolocation
US PATENT # 9,297,884 | EXPIRES NOVEMBER 27, 2034

This technology is an improved method of estimating the location of an emitter from received signals. Using a combination of cross-spectral methods and LaGrange interpolation, this technology more accurately estimates and tracks phase and frequency of received signals. The methods can be applied to a single received signal or can seamlessly integrate observations from multiple receivers to improve geolocation accuracy.

POTENTIAL APPLICATIONS:

- Search and rescue/recovery operations
- Mobile geolocation services
- Military and law enforcement
- Data communications



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